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THE EFFECTIVENESS OF A TEST-STUDY-TEST METHOD
OF SPELLING INSTRUCTION FOR BLIND THIRD-GRADE
STUDENTS IN A RESIDENTIAL SCHOOL.

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DIGEST

Statement of the Project

The main purpose of the study was to evaluate the effectiveness of a test-study-test method of spelling instruction for pre-typing, Braille-using blind students. The method was based on previous experimentation in general spelling methodology and was adjusted to the needs of Braille students.

Procedures Followed

The study sample consisted of third-grade blind students enrolled in residential schools and was divided into an experimental group and a comparison group. The experimental group received a pre-test at the beginning of the experimental semester, the experimental method of instruction, and a post-test at the conclusion of the experiment. The comparison group received only the pre- and post-tests.

The findings in general spelling methodology on which the experimental method of instruction was based stipulated that each spelling period should be twenty minutes long and conducted daily, that the test-study-test method and the corrected test approach should be used in each week's lesson, and that words should be presented in list form, but study should not include syllabification or phonetic analysis of words. Findings also suggested that drill over individual words should be encouraged as well as the use of words in

creative writing, and that high achievers on initial spelling tests could be excused from study and assist weaker students in their study.

The instructional method is described for each student as follows: a weekly initial test on the words assigned is given; the missed words are studied according to the stipulated procedure; and the final test over the week's words is given at the end of each week.

The stipulated study procedure for experimental students consisted of specific steps for each word missed; a word was softly read from correct-copy; it was quietly spelled after reading it; spelling the word in full was attempted by writing it; and attempts were checked against correct-copy for accuracy. These steps were repeated twice more so that upon study procedure completion, each student had three correctly spelled copies of each missed word.

Conclusions

Based on the analysis of data received the major conclusion drawn was that there was no significant difference between the experimental and comparison groups on the post-test, given after the experimental method of instruction, when the variable of pre-test differences was held constant. This implies that the experimental method of instruction was no better than the comparison, but limitations to the study tend to distort this finding.

ACKNOWLEDGMENTS

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To Mrs. Estelle Hagood and Miss Freda Henderson, both exceptional teachers of the blind, thanks are offered for their participation in the research segment of the project.

The multitude of individuals who have been directly and indirectly responsible for the ultimate completion of this project precludes mentioning all their names, but gratitude to each is implied with the project.

C.R.

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CHAPTER I

BACKGROUND TO THE STUDY

Classroom methods for teaching the various elementary subjects to blind children have generally evolved through actual teaching situations rather than through methodological experimentation. Educators' recent critical analyses of instructional methods have heightened interest in teaching techniques.¹ Only by seeking a superior method of instruction through establishing experimentally the value of present methods can the educator fulfill his responsibility for the blind child's individual optimal development.

The ability of the general population to spell correctly is declining.² A comparison study of the results gained in 1918 and again in 1947 utilizing the same testing scale for spelling indicated a higher per cent of correct scores for the earlier pupils than for the later ones.³ One

¹Samuel C. Ashcroft, "A New Era in Education and a Paradox in Research for the Visually Limited," Exceptional Children, XXIX (April, 1963), p. 376.

²Andrew M. Doyle, "A Study of Spelling Achievement," Catholic Educational Review, XLVIII (March, 1950), p. 174.

³Calvin S. Sifford, "A Survey of Spelling Ability," Elementary School Journal, XLVII (February, 1947), pp. 340-46.

causal theory for the decline in correct spelling ability has been proposed by Thomas Horn. Based on his recent survey of spelling texts and workbooks he contends that teachers are "perpetuating one of the most inferior methods of spelling instruction," by not following the suggestions of research in spelling.⁴ Appropriate use of the findings of research in instruction was found by Fox and Eaton to indicate improvement in spelling competency.⁵ It is suggested that until instructional methods in spelling utilize the known facts of research, children will remain inferior in spelling abilities.

Further research for facts is not the most pressing need in spelling, but rather the instructional application of established facts and principles.⁶ The need for research in the various aspects of learning as well as the skillful incorporation of present learning theory into classroom practice is also important.⁷ Utilization of facts derived

⁴Thomas D. Horn, "Research in Spelling," Elementary English, XXXVII (March, 1960), p. 174.

⁵William H. Fox and Merrill T. Eaton, "Analysis of the Spelling Proficiency of 82,833 Pupils in Grades Two to Eight in 3547 Teaching Units of the City Schools in Indiana," Bulletin of the School of Education, Indiana University, XXII (March, 1946), pp. 1-45.

⁶Ernest Horn, "Research in Spelling," Elementary English Review, XXI (January, 1944), pp. 6-13.

⁷Ernest Horn, "Spelling," Encyclopedia of Educational Research, ed. Walter S. Monroe (New York: The Macmillan Company, 1941), pp. 1166-83.

from spelling research plus those of related areas can improve classroom instruction in spelling.

As general educators in the area of elementary spelling are emphasizing methods, so are educators of the blind stressing the need for appropriate methodology in the various curriculum areas. Nolan makes the following statement in his comparison of the research in the education of the blind and the education of the sighted.

The existence of educational media implies that educational methods for teaching children to use them are available. No major research on development or evaluation of educational methods for blind children has been conducted.⁸

Nor has any attempt been made to compare the effectiveness of educational methods in any particular subject area.⁹

This lack in the education of blind children must be eliminated. Extensive research in spelling instruction for normal children guides present investigations of spelling methods for blind children.

Comparisons of the blind and the seeing child of equal chronological ages indicate that the blind child is functioning below his age-group equivalent and is

⁸Carson Y. Nolan, "The Visually Impaired," Behavioral Research on Exceptional Children, eds. Samuel A. Kirk and Bluma B. Weiner (Washington, D. C.: The Council for Exceptional Children, National Education Association, 1963), p. 128.

⁹Ibid., p. 137.

considered retarded in certain basic school subjects.¹⁰ Major problems in this apparent retardation appear to be in the methodology and in the media of instruction. Achievement retardation is not a unique aspect of blindness per se; rather, the potential of the child has not been fully realized by present methods.¹¹

Ernest Horn maintains that spelling should be an important part of the general elementary curriculum even though it is a minor subject.

The advantages of good spelling ability and the disadvantages of poor spelling ability amply justify careful, systematic planning for helping pupils learn to spell correctly.¹²

Horn's frame of reference is spelling for the sighted child. It is assumed that his suggestion for increasing emphasis on spelling skills can have relevance to the blind child because the blind in the residential school "follow grade-by-grade about the same courses of study which are followed in the public school."¹³ The

¹⁰Samuel A. Kirk, Educating Exceptional Children (Boston: Houghton Mifflin Company, 1962), p. 225.

¹¹Miriam Norris, Patricia J. Spaulding, and Fern H. Brodie, Blindness in Children (Chicago: University of Chicago Press, 1957), p. 56.

¹²Ernest Horn, Teaching Spelling, What Research Says to the Teacher (Washington, D. C.: Department of Classroom Teachers, American Educational Research Association of the National Education Association, 1954), p. 3.

¹³Berthold Lowenfeld, "The Child Who is Blind," What Is Special About Special Education (Washington, D. C.: The Council for Exceptional Children, National Education Association, 1953), p. 9.

main difference is in the mode of reading and writing. This mode is termed Braille and has been likened to "speed writing" or to shorthand in clerical work. The use of this unique code as the child's chief learning channel and written communication method restricts him in his interaction with sighted individuals.¹⁴ To encourage this interaction, the blind child is often instructed in typing in the primary grades.¹⁵

The construction of the Braille code creates problems for blind children.¹⁶ The subsequent transition from Braille to typing can cause further difficulty.¹⁷ Although the correlation between reading skills and writing skills in Braille is high,¹⁸ as the child changes to typing and the full-word spelling, the relationship

¹⁴Georgie Lee Abel, "The Education of Blind Children," Education of Exceptional Children and Youth, eds. William M. Cruickshank and G. Orville Johnson (Englewood Cliffs, N. J.: Prentice-Hall, Incorporated, 1958), pp. 323-324.

¹⁵C. Edith Cohoe, "Typewriting Instruction for Partially Seeing and Blind Children," Exceptional Children, XXVIII (September, 1961), p. 13.

¹⁶Anthony J. Pelone, Helping the Visually Handicapped Child in a Regular Class (New York: Bureau of Publications, Teachers College, Columbia University, 1957), p. 71.

¹⁷Merle E. Frampton, Education of the Blind (New York: World Book Company, 1940), p. 98.

¹⁸Leo F. Hanley, "A Brief Review of the Research on Braille Reading," International Journal for the Education of the Blind, X (March, 1961), p. 68.

between what he reads in Braille and what he now writes in print is diminished.¹⁹ This diminished relationship suggests the necessity of correct spelling skills prior to instructional introduction to typing.

On the basis of his study in oral reading errors, Ashcroft suggested that there were three categories which involved most of the errors in orthography (mode of spelling). These were short-form words (brief-forms), multiple cell contractions, and combinations of orthography. These three categories included only twenty-eight per cent of the total number of words in the study, but contributed forty-six per cent of the total number of errors made.²⁰ Although it was recognized that the use of Braille involves areas of confusion for the child, it represents the best method of tactual reading available to date.

I. THE PROBLEM

Statement of the Problem

The specific purpose of this study was (1) to formulate a test-study-test method of spelling instruction based on earlier experimental findings in general spelling methodology; (2) to adjust the method for instructing

¹⁹Merle E. Frampton, Education of the Blind (New York: World Book Company, 1940), p. 98.

²⁰Samuel C. Ashcroft, Errors in Oral Reading of Braille at Elementary Grade Levels (Urbana: University of Illinois, 1960).

blind children in spelling using Braille as a communication medium; and (3) to evaluate the effectiveness of the method for increasing the spelling skills of the experimental subjects by using a comparison group who did not receive the experimental method.

Need for the Study

Spelling as a subject is a minor part of the elementary curriculum but the inability to spell correctly reflects throughout other subjects and through life itself. Emphasis on correct spelling should permeate the total school life of children to assist them in correct written communication immediately and in the future.

This general need for correct spelling for all students is applicable to blind students as well. Their use of the Braille code, however, impedes their progress and emphasizes the necessity of specific successful methods for instruction in spelling.

The Braille code is based on abbreviated spelling of words (contractions) and on symbols representing words (brief-forms). For example the letter c formed by dots one and four of the code, means not only c but also stands for can. Therefore in reading and writing can is spelled c rather than c-a-n. When the Braille-user attempts to initiate typing as a skill of communication, he is not only hampered by the physical and mental involvement of learning to type, but also must learn correct spelling.

Therefore it seems that instruction in spelling must take on added emphasis for pre-typing Braille students to assist them in transferring from Braille to typing. As a part of this increased emphasis on correct spelling, classroom methods of teaching must be explored to determine the most effective way of fulfilling this responsibility.

This study tested one particular method of spelling instruction, the test-study-test method, to determine if it would increase the blind student's accuracy in spelling. Other program modifications which have been the subject of experimentation in spelling programs for seeing children were not included in the present study. The selected method was an expansion of the current methods of instruction at the selected residential schools and was determined by the degree of program alteration permitted by the school administration.

II. DEFINITIONS OF TERMS

It was necessary for clarity to subdivide the following definitions into categories because of the lack of studies dealing with both blindness and spelling. The categories are (1) general terms; (2) terms specific to blindness; and (3) terms specific to spelling.

General Terms

Educationally exceptional. That child who deviates from the average or normal child in mental, physical, or social characteristics and whose deviation is of such kind and degree that it interferes with his development under

ordinary classroom procedure is considered educationally exceptional.²¹

Special education. Special education has general education as its base but also encompasses modifications of, or additions to, school practices intended for the ordinary child. Special education includes practices that are of unique, uncommon, or unusual quality, and in particular are in addition to the organization and instructional procedures used with the majority of children.²²

Residential school. Residential school as used in the study will mean specifically state supported schools for the blind. The term is defined as a boarding school which blind children generally attend for nine months of the year; where they live, go to school, and even learn vocations.²³

Terms Specific to Blindness

Legal definition of blindness. A child is legally blind who has a central visual acuity of 20/200 or less in the better eye, with correcting glasses; or has a central visual acuity of more than 20/200 but there is a field defect in which the peripheral field has contracted to such an extent that the widest diameter of the visual field subtends an angular distance no greater than twenty degrees.²⁴

²¹Samuel A. Kirk, Educating Exceptional Children (Boston: Houghton Mifflin Company, 1962), pp. 4-5.

²²Ibid., p. 29.

²³Ibid., p. 228.

²⁴C. Edith Kerby, Manual on the Use of the Standard Classification of Causes of Blindness (New York: The American Foundation for the Blind, 1940), p. 3.

Educational definition of blindness. The educationally blind are individuals whose visual losses indicate that they can and should function in the total educational program chiefly through the use of the Braille system, audio aids, and special equipment necessary for them to pursue education effectively without the use of residual vision.²⁵

The Braille code. The code is a system of representing letters by raised dots; each character (cell) is formed by using one or more dots. By means of various combinations of dots the equivalent of any inkprint character can be written. Each dot in the cell has an identifying number and, in instruction of Braille, the number is used in reference to a particular dot.²⁶

Grades of Braille. Standard English Braille consists of two grades: Braille Grade 1 and Braille Grade 2. Braille Grade 1 is comprised of the letters of the alphabet, punctuation, and numbers. However, due to the large size of Braille letters and the space which they require on writing paper, many words are contracted and abbreviated in Braille. These make up a part of Standard English Braille

²⁵Itinerant Teaching Services for Blind Children (New York: American Foundation for the Blind, Group Reports, No. 5, 1957), p. 55.

²⁶Anthony J. Pelone, Helping the Visually Handicapped Child in a Regular Class (New York: Bureau of Publications, Teachers College, Columbia University, 1957), pp. 68-69.

Grade 2, which also includes one-hundred and eighty-five contractions and short-form words.²⁷

Contractions. A contraction is a Braille sign used to express a sequence of two or more letters occupying one or more cells and representing parts of words or whole words.²⁸

Brief-forms. Brief-forms are Braille signs which are written as abbreviations and represented by their characteristic letters.²⁹

Terms Specific to Spelling

Test-study-test method. The name given to the planned approach to spelling is the test-study-test method of instruction.³⁰ The child is first tested on a group of words to discover wherein he has difficulty with spelling. He then studies the missed words following a sequential study program and is tested again.

Correct-copy. The correct-copy is a master list of the full spelling of a group of selected words to be used

²⁷Anthony J. Pelone, Helping the Visually Handicapped Child in a Regular Class (New York: Bureau of Publications, Teachers College, Columbia University, 1957), pp. 70-71.

²⁸Ibid., p. 71.

²⁹Ibid., p. 72.

³⁰Arthur I. Gates, "An Experimental Comparison of the Study-test and the Test-study Methods in Spelling," Journal of Educational Psychology, XXII (June, 1931), pp. 1-19.

by the child in self-correction of his weekly tests and in his study skills.³¹

III. LIMITATIONS OF THE STUDY

The study had some basic limitations. An important one was the use exclusively of residential schools for the blind. Testing this method by sampling from both residential and public day school classes would have been more revealing and possible variables inherent in placement would have been controlled. However such sampling was not feasible in the scope of this study. Generally, the schools for the blind report that fifty per cent of their legally blind students use Braille, while in public schools it is reported as only eight per cent.^{32,33} Thus selection of a residential school provided a greater sample of Braille students.

A second restriction was in the selection of the instructional method to be tested. The two schools used comparable methods prior to the experiment, and neither placed particular emphasis on spelling. The selected method was a refinement of present procedure rather than a different approach. This limitation reflects the belief of the school administration

³¹Edward A. Perkins, Jr., "Develop Good Spellers with this Transcription Plan," Business Education World, XLI (May, 1961), p. 22.

³²John W. Jones, Blind Children: Degree of Vision, Mode of Reading, Bulletin 1961-24 (Washington, D. C.: Government Printing Office, 1961), p. 33.

³³Rachel F. Rawls, "Use of Braille and Print Reading Material in Schools for the Blind," The International Journal for the Education of the Blind, XI (October, 1961), p. 23.

that a drastic change in instructional procedure, isolated as it was between what transpired in the preceding and following grades, would be detrimental to sequential learning by experimental students.

This study was also restricted to third-grade pupils in the residential school. Because typing is usually introduced at the fourth-grade level,^{34,35,36} and the change from Braille code to typing introduces additional problems,³⁷ it was deemed advisable for post-typing students to be excluded from the study. First- and second-grade students were not included because specific spelling skills at these levels are limited and emphasis on development of Braille skill in reading and writing is highly important. By third-grade, however, most blind children are relatively competent in Braille, and emphasis can be given to improving spelling skills. It is suggested that "the older and further on in the grades the poor speller is, the more his discouragement over spelling difficulties becomes. . . ."³⁸

³⁴Rachel F. Rawls and Ethel E. Lewis, "Braille Writing in Schools and Day Classes for the Blind in the United States," The International Journal for the Education of the Blind, XI (December, 1961), pp. 42-46.

³⁵Edith Cohoe, "Typewriting Instruction for Partially Seeing and Blind Children," Exceptional Children, XXVIII (September, 1961), pp. 13-18.

³⁶Nina K. Richardson, "Teaching the Blind to Type," The Balance Sheet, XLII (February, 1961), p. 258.

³⁷Merle E. Frampton, Education of the Blind (New York: World Book Company, 1940), p. 40.

³⁸Garry Cleveland Myers, "Spelling: Ways of Helping Pupils Who Fail in Spelling," Grade Teacher, LIII (March, 1936), p. 40.

Thus sampling was restricted to the pretyping third graders to enable the utilization of the method suggested.

Although the experimental children were equated with the comparison children on several variables, the fact that the experimental group was in one state's school for the blind while the comparison group was in another state could be viewed as a limitation. This was unavoidable due to the small number of blind children in any one state school meeting the established criteria.^{39,40}

Another limitation to the study was the administrative aspects relating to class size in each of the programs. The experimental school had one teacher of third grade for fifteen students while the comparison school had two teachers for fourteen students.

IV. CHAPTER SUMMARY

The problem to be solved by this study was three-fold: (1) the formulation of a test-study-test method of spelling instruction based on earlier experimental findings in general spelling methodology; (2) the adjustment of the method to make it appropriate for instructing blind children in spelling using Braille as a communication medium; and

³⁹Ralph G. Hurlin, "Estimated Prevalence of Blindness in the United States," Outlook for the Blind, XLVII (Spring, 1953), p. 190.

⁴⁰C. Edith Kerby, "Causes of Blindness in Children of School Age," Sight Saving Review, XXVIII (Spring, 1958), p. 20.

(3) the evaluation of the effectiveness of the method for increasing the spelling skills of the experimental subjects.

The blind child is taught to type early in his educational career as it is believed that effective written communication from the blind to the sighted is dependent upon proficiency in typing skills. The Braille code used by the blind in learning to read and to write restricts adequate spelling skills by its use of abbreviations and brief-forms. Therefore correct spelling must be emphasized before the child begins typing instruction.

There were some basic limitations to the study which are as follows: (1) the total population for the study was drawn from residential schools for the blind; (2) selection of the experimental method of instruction was restricted by local policy, thus the differences between the two methods of spelling were small; (3) the study was restricted to pupils in the third-grade; (4) the experimental group was drawn from one state's school for the blind while the comparison group was drawn from a second state's school; and (5) the experimental subjects were in one group with one teacher while the comparison group was divided between two teachers.

CHAPTER II

REVIEW OF THE LITERATURE

Information specifically related to teaching spelling to blind children is extremely limited and generally reports an individual's thoughts on the subject rather than reporting research conducted. Therefore this review will be limited to a general overview of the education of blind children and to reports of selected research conducted with sighted children in spelling.

I. EDUCATION OF THE BLIND

Historical Background

Much interest has been evidenced in works dealing with historical development of education and treatment of the blind throughout the centuries. Although it has been shown that some kind of instruction was given blind persons as early as 1178, it was not until 1784 that Valentin Haüy (1745-1822) instituted the first systematic experiments in methodology. Credit is extended to him as the first real teacher of the blind.¹ Based on this beginning, programs and schools spread throughout Europe. By 1810 most European capital cities had some type of program, and by the 1830's,

¹Merle E. Frampton, Education of the Blind (New York: World Book Company, 1940), p. vii.

four schools had been established in the United States.² By 1850, twenty-five of the states had schools.³ It was not until 1916, when interest in tests and measuring the mental faculties was reaching its stride, that Samuel P. Hayes began to adapt existing standardized achievement tests as the first real attempt to measure the achievement of the blind child.⁴

Concentration of services had been delegated to residential schools until near the end of the nineteenth century when early efforts to organize day school classes for the blind met with success.⁵ Today every state maintains some type of educational services for blind children, either in programs within the state or through contracted services from adjoining states. Zahl,⁶ in his comprehensive treatment of the aspects of blindness, gives a more detailed

²Merle E. Frampton and Elena D. Gall, "The Physically Handicapped and Special Health Problems," Special Education for the Exceptional, Vol. II (Boston: Porter-Sargent Company, 1955).

³Harry J. Baker, Introduction to Exceptional Children (New York: The Macmillan Company, 1944), p. 70.

⁴Rudolf Pintner, Jon Eisenson and Mildred Stanton, The Psychology of the Physically Handicapped (New York: E. S. Crofts and Company, 1941), p. 219.

⁵National Society for the Study of Education, The Education of Exceptional Children, Forty-ninth Yearbook, Part II (Chicago: University of Chicago Press, 1950), p. 34.

⁶Paul A. Zahl (ed.), Blindness: Modern Approaches to the Unseen Environment (Princeton, N.J.: Princeton University Press, 1950), 576 pp.

treatment of the history of the education of the blind, as do Best,⁷ French,⁸ and Illingworth.⁹

Intellectual Comparisons

Blindness, or lack of normal vision, necessitates a qualitative and quantitative analysis of what a blind child can and cannot be expected to do from the outset. Blindness is only one aspect of the child's entire make-up. Attention must be given to his total being with emphasis on his intellectual functioning to determine ability in comprehension of techniques used by the blind in meeting the demands of his environment. It has been stated that the blind child, upon entering school, can be expected to function educationally between one and three years below the normal expectancy of his sighted peers. One cause for this apparent retardation^{10,11,12} is limited environmental stimulation.

⁷Harry Best, Blindness and the Blind in the United States (New York: The Macmillan Company, 1934), 714 pp.

⁸Richard S. French, From Homer to Helen Keller (New York: American Foundation for the Blind, 1932), 298 pp.

⁹W. H. Illingworth, History of the Education of the Blind (London: Sampson, Low, Marston and Company, Limited, 1910), 167 pp.

¹⁰J. R. Greaves, "Helping the Retarded Blind," International Journal for the Education of the Blind, II (April, 1953), pp. 163-64.

¹¹M. Adair, "Working with the Slow-learning Blind Child," International Journal for the Education of the Blind, I (1951), pp. 37-39.

¹²Merle E. Frampton, "The Blind," Special Education for the Exceptional, ed. Merle E. Frampton and Elena D. Gall (Boston: Porter-Sargent Company, 1955), pp. 4-5.

The environment of a blind child encompasses only those aspects of his environment which he hears, smells, tastes, and feels.^{13,14} The sighted child is constantly stimulated not only by these things, but has the distinct advantage of stimulation by anything within his visual realm.

It is understandable, then, that the blind child of normal intelligence would appear to be retarded when compared with his sighted peers. This comparison of the blind to the sighted causes the blind to appear to rate low in intelligence. Intelligence is neither raised nor lowered because of blindness, but blindness and lowered intellectual functioning are often associated as circumstantial effects of some underlying constitutional defect.¹⁵ The only retardation in which blindness could be a cause is termed "pseudo-retardation," or apparent mental retardation in a child of normal intelligence.¹⁶ Limitations in the opportunities for learning experienced by the blind child

¹³Carl Weiss, "Reality Aspects of Blindness as They Affect Case Work," The Family, Reprint 1 (February, 1946).

¹⁴Berthold Lowenfeld, "Psychological Problems of Children with Impaired Vision," Psychology of Exceptional Children and Youth, ed. William M. Cruickshank (Englewood Cliffs, N. J.: Prentice-Hall, Incorporated, 1955), p. 222.

¹⁵Samuel P. Hayes, Contributions to a Psychology of Blindness (New York: American Foundation for the Blind, 1941) pp. 16-48.

¹⁶Jane Hallenbeck, "Pseudo-retardation in Retrolental Fibroplasia," The New Outlook for the Blind, XLVIII (November, 1954), p. 301.

contribute more to those deficits associated with blindness than the physical handicap itself.^{17,18}

Learning

The processes by which passive becomes active knowledge, including recognition, implanting, and establishing, are the same for comparable children, whether sighted or blind. Motivation, insight, exercise, activity, repetition, and various forms of reinforcement are educational methods which, when integrated, seem successful in transforming passive into active knowledge. The extent of this integration is the key to successful teaching and learning with both the blind and the sighted.¹⁹

II. SPELLING METHODOLOGY

The body of literature related to spelling instruction includes reports of the relative values of the use of phonetics, contextual clues, and structural analysis as well as the examination of various teaching strategies. The present review, however, is directed specifically to experimentation related to the instructional methods employed in the present study.

¹⁷Miriam Norris, Patricia J. Spaulding, and Fern H. Brodie, Blindness in Children (Chicago: University of Chicago Press, 1957), p. 65.

¹⁸Miriam Norris, The School Age Blind Child Project (New York: American Foundation for the Blind, 1961), p. 10.

¹⁹Berthold Lowenfeld, "Psychological Problems of Children with Impaired Vision," Psychology of Exceptional Children and Youth, ed. William M. Cruickshank (Englewood Cliffs, N. J.: Prentice-Hall, Incorporated, 1955), pp. 214-72.

In 1951, Fitzgerald proposed that the entire program in spelling could be based on research findings and that through implementation, spelling skills could be increased.²⁰ The reviewed literature seemed to support his suggestions and to indicate certain related principles, ten of which were isolated and are reported here as guidelines to the experimental method.

Guideline 1: Spelling should be taught five days a week in specific spelling periods, the optimum length of each period being twenty minutes. In the extensive analysis of spelling proficiencies conducted by Fox and Eaton it was discovered that the best spelling in Indiana was done in the school in which spelling was taught five days a week for twenty minutes each day.²¹ In the brief report of the study of the following year these findings were supported.²²

Guideline 2: The test-study-test method of teaching spelling is superior to the study-test method. The superiority of the test-study-test method was established by Gates in 1931.²³

²⁰James A. Fitzgerald, The Teaching of Spelling (Milwaukee: Bruce Publishing Company, 1951), 233 pp.

²¹Fox and Eaton; "Analysis of the Spelling Proficiency of 82,833 Pupils in Grades Two to Eight in 3547 Teaching Units of the City Schools in Indiana," pp. 1-45.

²²William H. Fox, "Spelling Proficiency in Township Schools in Indiana," Bulletin of the School of Education, Indiana University, XXIII (January, 1947), pp. 1-31.

²³Arthur I. Gates, "An Experimental Comparison of the Study-test and the Test-study Methods in Spelling," Journal of Educational Psychology, XXII (June, 1931), pp. 1-19.

His findings have been supported by later studies of limited scope.^{24,25}

Guideline 3: Spelling words should be presented in lists rather than context form. Wilson, in reviewing the historical development in the area of spelling, concluded that research since 1900 supports the use of lists as opposed to contextual form of initial presentation.²⁶ Based on acceptance of the initial presentation of spelling words in list form, the explorations of the lists published by book companies indicate the specific words included in the lists are selected for the various grade levels in keeping with the expectancies of that grade and the usefulness of the word to the child.^{27,28}

Guideline 4: Syllabifying words may cause errors in spelling and exert a negative influence on learning to spell. Conclusions drawn from the investigated effects of a syllabic presentation of words indicate that this way of presenting gave no particular advantage and even suggest

²⁴Helen Maria Shubik, "An Experimental Comparison of the Test-study and the Study-test Methods of Teaching Spelling in the Third Grade" (Unpublished Master's thesis, Fordham University, New York, 1951), p. 95.

²⁵Donald Elmo Wilson, "The Development of Spelling in the Elementary School Curriculum" (Unpublished Doctor's thesis, University of California, Los Angeles, 1951), p. 343.

²⁶Ibid., p. 338.

²⁷Richard H. Bloomer, "Word Length and Complexity Variables in Spelling Difficulty," Journal of Educational Research, XLIX (March, 1956), p.535.

²⁸Paul S. Hollingsworth, "Spelling Lists -- Outdated?" Elementary English, XLII (February, 1965), pp. 151-152.

that dividing certain words into syllables could cause errors in spelling, or in effect, exert a negative influence on learning.²⁹

Guideline 5: Phonetic analysis of words does not increase the ability to spell them correctly. One of the persistent controversies in the area of spelling is based on the belief held by some individuals in the field that if a student can pronounce the word correctly he should be able to spell it. Ernest Horn suggests not.³⁰ It was noted in 1955 that there was no specific relationship between representation of individual sounds and persistence of spelling difficulty.³¹ Hahn reports that his results did not bear out the assumption that increased emphasis on phonics resulted in greater ability to spell and agreed that the assumption had little basis in fact.³²

Guideline 6: The most efficient single procedure for learning to spell correctly is the corrected-test approach; each pupil corrects his own spelling test while the teacher

²⁹Thomas D. Horn, The Effect of a Syllabic Presentation of Words Upon Learning to Spell (Iowa City: State University of Iowa, 1947).

³⁰Ernest Horn, "Phonetics and Spelling," Elementary School Journal, LVII (May, 1957), pp. 424-32.

³¹Walter T. Petty, "An Analysis of Certain Phonetic Elements in a Selected List of Persistently Difficult Spelling Words" (Unpublished Doctor's thesis, State University of Iowa, Iowa City, 1955), p. 689. (Dissertation Abstracts 15, No. 8, 1955, pp. 1359-1360.)

³²William P. Hahn, "Phonics: A Boon to Spelling?" Elementary School Journal, LXIV (April, 1964), pp. 383-386.

spells each word orally. Self-correction of tests as feedback to the pupil has been shown to be one of the stronger variables facilitating learning.^{33,34} Eichholz reports that, although his three groups were taught in the same manner, the two groups using the self-check device showed significantly greater gains in spelling over the control group.³⁵

Guideline 7: Drill facilitates discrimination between words having small differences. In studies designed to measure the effectiveness of drill in spelling skills, it has been shown that the drill is effective in differentiating between words which are very similar and in increasing the learning of these words.³⁶

Guideline 8: Use of spelling words in creative writing increases the ability to spell the words correctly. This assumption is somewhat based on drill as described in the statements above, and implies that one method of drill is the use of selected words in creative and contextual form after their initial presentation to the child. It has been

³³Lee J. Cronbach, Educational Psychology (New York: Harcourt, Brace and World, Incorporated, 1962), p. 277.

³⁴Fred S. Keller, Learning - Reinforcement Theory (New York: Random House, 1962), p. 8.

³⁵Gerhard C. Eichholz, "Spelling Improvement Through a Self-Check Device," Elementary School Journal, LXIV (April, 1964), pp. 373-376.

³⁶Richard H. Bloomer, "Stimulus Properties of Words: Variables Related to Spelling Difficulty" (Unpublished Doctor's thesis, University of Southern California, Los Angeles, 1959), p. 389.

theoretically suggested and experimentally verified that using the spelling words will increase the child's proficiency.^{37,38,39}

Guideline 9: Pupils showing high achievement on the weekly initial test can be excused from formal spelling instruction. If the final weekly tests are continued to insure that the student maintains his level of achievement in spelling, excusing the high achiever from formal instruction has been suggested as a form of enrichment to motivate all students to do well on the initial tests.⁴⁰

Guideline 10: Students showing high achievement on the weekly initial test may assist other children individually to master their difficult words. By using enthusiastic group cooperation, Bandle established that consistent improvement could be gained by utilization of

³⁷Ernest Horn, Teaching Spelling, What Research Says to the Teacher (Washington, D. C.: Department of Classroom Teachers, American Educational Research Association of the National Education Association, 1954), pp. 12-13.

³⁸Wilhelmina K. Robbins, "Spelling Errors in the Writing of Second and Third Grade Children" (Unpublished Master's thesis, State University of Iowa, Iowa City, 1948), p. 174.

³⁹James E. Goss, "Analysis of Accuracy of Spelling in Written Compositions of Elementary School Children and the Effects of Proof-reading Emphasis upon Accuracy" (Unpublished Doctor's thesis, University of Oklahoma, Normal, 1959), 107 pp.

⁴⁰George C. Kyte, "When Spelling Has Been Mastered in the Elementary School," Journal of Educational Research, XLII (September, 1948), pp. 47-53.

the more skilled spellers in the class as helpers for the less skilled students.⁴¹

III. CHAPTER SUMMARY

Education of the blind is interwoven throughout history with reports as early as 1178. Today every state in the United States and most countries abroad have established some type of educational services for their blind populations.

Intellectually the blind as a group seem to rate somewhat lower in reported intelligence quotients than their sighted peers. The cause is not the physical defect of blindness as such. The lowered intelligence quotient could be an attribute or side-effect of blindness because stimulation of the thought processes is limited when one major avenue of intake of information has been impaired. Given this, the educational method involved in transforming passive knowledge into active, is basically the same for both the blind and the sighted. Only the tools are different.

Based on the assumption of sameness in methods the experimental method was patterned after designs used with sighted children.

⁴¹Glen Hays Bandle, "The Influence of Group Cooperation on Spelling Achievement" (Unpublished Master's thesis, State University of Iowa, Iowa City, 1949).

CHAPTER III

METHODS OF THE STUDY

The test-study-test method of spelling instruction based on earlier experimental findings in general spelling methodology was adjusted to meet the educational needs of Braille-using blind students. Two groups of subjects were selected from two state residential schools for the blind with all subjects within a specified range of chronological ages and intelligence quotients. All subjects were in the third grade and used Braille as their chief communication medium.

The experimental group took the initial Stanford Achievement Test, received the experimental method of instruction and then took the final Stanford Achievement Test. The comparison group received only the pre- and post-tests. The differences between the initial and the final test scores supplied the data on which the analysis was based.

I. DESCRIPTION OF THE SAMPLE

The population for the study was selected from two residential schools for the blind due to the limited enrollment in either school. The experimental subjects were in the Texas School for the Blind, the comparison subjects in the Tennessee School.

The Schools

Texas School for the Blind. The Texas School for the Blind was established in 1856 as the Asylum for the Blind. In 1905 the name was changed to Blind Institute, and in 1915 the Texas Legislature adopted the present name.

The Thirty-fourth (1915) and the Thirty-fifth (1917) Legislatures appropriated monies to build facilities on seventy-three acres in north-west Austin donated by the citizens of Austin, Texas. The School was moved to this location and its present buildings in the fall of 1917.

The total enrollment for the 1963-1964 school year was two hundred and twenty-three white blind pupils between the ages of six and twenty-one years. It is a twelve grade school with twenty-three and one half credits, enabling graduates to enter any state college.

The purpose of the Texas School is to give ample educational opportunities to all Texas "white, blind scholastics of educable mind."¹

Tennessee School for the Blind. The Tennessee School for the Blind was established by the Tennessee Legislature on January 29, 1844, and is presently located in Donelson, Tennessee, seven miles east of Nashville. The campus consists of twenty-five acres with ten new and modern

¹W. E. Allen, Superintendent's Annual Report, Texas School for the Blind (Austin, Texas: Texas Education Agency, 1963), pp. 3-5.

fireproof buildings plus seventy-five acres used for farming. The School moved to its present location in September, 1952. The site is the Clover Bottom Farm, a part of the estate of Andrew Jackson and his wife, Rachel Donelson.

The usual enrollment for the School is approximately one hundred and seventy-five students in the white division. The course of study extends from first through twelfth grades with emphasis on vocational subjects. Any graduate of the Tennessee School for the Blind may be admitted to any state college in good standing. The specific purpose of the School is to provide educational opportunities to all blind and partially sighted children of Tennessee who cannot adjust to the regular public school program.²

Criteria for Inclusion in the Study Sample

All subjects involved in the study were enrolled in the third grade of their respective schools and used Braille as their learning medium. The criteria for eligibility allowed a chronological age between eight and twelve years and an intelligence quotient above seventy.

Initially fifteen students in the Texas School were considered for eligibility for the study. Two of the students did not receive individual psychological examinations and one of these had not learned Braille sufficiently to be able to

²E. J. Wood, Superintendent, Tennessee School for the Blind, personal communication, June, 1963.

perform. After deleting the ineligible, the experimental group contained thirteen students who fitted the criteria established for the study and were included in the experimental procedure.

Fourteen students were available for the comparison group in Tennessee. Three of these students were too old for the upper limit set at twelve years and one child withdrew before the final test was administered. Ten subjects were eligible for the comparison group.

The actual chronological age of each of the subjects can be seen in Table X, page 74 of the Appendix. The mean chronological age for the experimental group of nine years, nine months, closely compares with the mean chronological age of the comparison group of ten years, one month. The range of ages for the experimental group was eight years and eight months to eleven years and seven months; for the comparison group the range was eight years and seven months to eleven years. The two groups were equated on chronological age.

The intelligence quotients of the subjects were reported to the investigator through the administrative office of the respective schools. The Hayes-Binet Test for the visually handicapped was used with nineteen subjects to determine the individual intelligence quotients. Four subjects were tested using the Wechsler Intelligence Scale for Children.

Table XI, page 75 of the Appendix shows the intelligence quotients for each subject in the study sample. The mean intelligence quotient for the experimental group was

100.46; for the comparison group, it was 97.20. The range of experimental scores was from 75 to 124; comparison scores were from 80 to 122. The groups were also equated on intelligence quotients.

II. EXPERIMENTAL DESIGN

Pre- and Post-tests

Initial test. The Stanford Achievement Test, Form W of the spelling subtest, was administered to all experimental and comparison subjects at the beginning of the second semester, 1963-1964 school year, and furnished initial mean scores for both groups. The test also provided each experimental subject a base score which was projected five-tenths of a year to determine individual expectations for the semester.³

Final test. Form X of the Stanford Achievement Test was administered at the end of the semester. The mean differences between the pre- and post-tests for the two groups were compared. Individual experimental raw scores were used to determine differences between the projected expectancy and the actual final score. In this way the comparison group furnished one control and the experimental group's projected expectancy scores provided a second control.

³Truman L. Kelley and others, Stanford Achievement Test, Directions for Administering Primary II Battery (New York: Harcourt, Brace and World, Incorporated, 1964), p. 26.

Classroom Methods

Experimental method. The experimental group received instruction in spelling with primary emphasis on a teaching procedure termed the test-study-test method of instruction.⁴ Subjects were initially tested on a selected group of words each week. Each student then studied his missed words following a sequential study plan which will be explained in the following chapter. All subjects then took the final weekly test and the results were compared to those of the first test of the week.

This procedure was repeated weekly for a total of seventeen weeks (one semester) and each student's progress or regression was charted to supply the teacher with exact figures in determining the rate of change.

The following requirements for the experimental method were based on findings in general spelling experimentation: (1) each spelling period was twenty minutes long and conducted daily; (2) the test-study-test method and the corrected test approach were used in each week's lesson; (3) words were presented in list form; study did not include syllabification or phonetic analysis of words; (4) drill over individual words was encouraged as was the use of the words in creative writing; and (5) high achievers on initial

⁴Arthur I. Gates, "An Experimental Comparison of the Study-test and the Test-study Methods in Spelling," Journal of Educational Psychology, XXII (June, 1931), pp. 1-19.

spelling tests were excused from study and assisted weaker students in their study throughout the week.

The major adjustment in the method as provided in general spelling methodology was in making it applicable to blind students through the medium of Braille. All materials including the lists of words, the correct-copy for each week, and the student's work were in Braille. The correct-copy was of primary importance in that it bridged the difference between the Braille code as it was read by the child, and the code in its full spelling for spelling and typing purposes.

Comparison method. The comparison group in the third grade at the Tennessee School received the usual quantity and quality of spelling instruction. The teachers were asked to continue their specific methods of instruction, making little or no alterations. There were, however, no restrictions placed on the comparison group. Appendix B, page 76, reports the responses of the comparison teachers to specific questions regarding their method.

The basic differences between the two methods can be listed as follows: (1) the experimental group was tested over the list of words prior to any study while the comparison group studied first; (2) the experimental subjects checked their own work, the comparison subjects did not; (3) emphasis was placed on phonetics and syllabifying words in the comparison group but not in the experimental; and (4) experimental high achievers on the initial weekly test assisted weaker students.

III. EVALUATIVE INSTRUMENT USED: THE STANFORD
ACHIEVEMENT TEST

Description

The publishers of the Stanford Achievement Test describe the test as follows:

Stanford Achievement Test is the designation of a series of comprehensive achievement tests developed to measure the important knowledges, skills, and understandings commonly accepted as desirable outcomes of the major branches of the elementary curriculum.⁵

The Primary II Battery was designed for use from the middle of grade two to the end of grade three and measures spelling ability by means of a thirty-item dictated spelling test. The approach which appears to be the most valid technique for measurement of spelling at the early grade levels was used and is described as follows: (1) the word to be spelled was pronounced by the teacher; (2) an illustrative sentence was read; (3) the word was repeated; and (4) the child wrote the word.⁶ The choice of words included in the spelling subtest was governed by a consideration of the frequency of use of words in written form by children in the primary grades.

⁵Truman L. Kelley and others, Stanford Achievement Test, Directions for Administering Primary II Battery (New York: Harcourt, Brace and World, Incorporated, 1964), p. 2.

⁶Ibid., p. 4.

Reliability Coefficients of the Test

The corrected odd-even split-half reliability coefficients and the estimate of Kuder-Richardson Formula 20 are given as .94 and .91 respectively for the spelling subtest in the third grade. The 2.0 standard error of measurement for this subtest is in terms of grade scores.⁷ The data are based on a sample of one thousand cases from third grades, drawn randomly from seventy-six school systems testing grades one through nine.⁸

Spelling Subtest

Each of the subtests of the Stanford Achievement Test tap enough samples of what they propose to measure that they can be used satisfactorily for a group diagnosis although the test publishers state that specific individual items of a particular subtest should not be used independently of the rest of that subtest.⁹

Buros' comments on the Stanford Achievement Test suggest that it is a respected tool for measuring the school age child:

It certainly looks in any case as if reliability is high enough in most grade levels in most subtests to insure that the tests sample adequately the domain of pupil achievement which they do sample.¹⁰

⁷Truman L. Kelley and others, Stanford Achievement Test, Directions for Administering Primary II Battery (New York: Harcourt, Brace and World, Incorporated, 1964), p. 30.

⁸Ibid.

⁹Ibid., p. 4.

¹⁰Oscar Krisen Buros (ed.), The Fifth Mental Measurement Yearbook (Highland Park, N.J.: The Gryphon Press, 1959), p. 79.

IV. CHAPTER SUMMARY

The study design stipulated that a method of spelling instruction based on earlier experimental findings in general spelling methodology be formulated and adjusted to meet the educational needs of Braille-using blind children.

The subjects participating in the study were selected from two state residential schools for the blind. Students enrolled in the Texas School for the Blind served as the experimental group while Tennessee School students composed the comparison group. The two groups were equated on intelligence quotients as well as on chronological ages. All subjects used Braille as their chief communication medium and were enrolled in the third grade in their respective schools.

The Stanford Achievement Test for third grade was given to all subjects at the beginning and end of the experimental period. The initial test furnished the performance mean for each group as well as individual experimental base scores. Results from the final test were compared with the initial test results to determine change.

The experimental group participated in the devised method of instruction while the comparison group continued in its usual method.

CHAPTER IV

CLASSROOM PROCEDURES

At the beginning of the spring term of the 1963-1964 school year students in the third grade experimental class at the Texas School for the Blind were informed about the proposed spelling experiment. Their full cooperation was pledged as they were excited about the new idea and possibility of change. The study procedure was briefly explained to the group with emphasis placed on the necessity of each child's doing his best.

As previously stated the experimental method was based on specific guidelines derived from regular spelling experimentation and adjusted to the needs of blind children.¹

I. SEMESTER PLAN

Both the experimental and comparison groups took the Stanford Achievement Test, Spelling Subtest, Form W, at the beginning of the second semester to establish a base score on all subjects. Experimental subjects were then introduced to the devised procedure by the teacher of the class. The students in the comparison group were given no specific direction from the investigator.

¹Supra., Chapter II, p. 21.

The experimental spelling class was held daily for seventeen consecutive weeks. A period of time was allotted usually prior to morning recess. It was believed that the students would be fresher and more alert during the morning hours, but the scheduling of the class was flexible enough to allow any change that might be necessary. The period for spelling was approximately twenty minutes each day, but this was also flexible in keeping with the needs of the students at particular times and with the varying difficulty of the lessons. The assigned teacher was responsible for the classroom procedure with the investigator of the study serving only in a supervisory capacity.

All words were presented in list form and were taken from the State adopted third-grade spelling textbook used by the Texas School for the Blind. Because the experiment was initiated at the beginning of the second semester, it seemed advisable to continue the students in the text in which they had begun the year. The title of the text used was My Word Book by Breed and Rogers.² The experiment began with Lesson Nineteen.

At the end of the experiment all subjects were tested again using Form X of the Stanford Achievement Test, spelling subtest.

²Frederick S. Breed and Don C. Rogers, My Word Book (Chicago: Lyons and Carnalhan, 1959), 108 pp.

II. WEEKLY PLAN

A set teaching approach for the experimental group was stipulated providing broad instructional guidelines. The teacher was encouraged to function within her own personality construction but to remain within the confines of the pre-arranged plan.

Each of the first sixteen weeks of the experimental method followed basically the same plan. Subjects were given a pre-test on the selected list of words for the week. Each immediately corrected his own pre-test as the teacher spelled the words orally. Words missed on the pre-test were studied during the week according to the experimental plan explained below. At the end of the week the students took a final test covering the weekly list. Each student corrected his own test and the number of missed words was recorded by the teacher. Initial and final scores for the week were compared to determine if there had been improvement. The teacher recorded all scores for subsequent evaluation of the child and the experimental method.

The Friday test of alternate weeks also included ten review words taken from the two previous weeks. Selection of the review words was determined by the difficulty exhibited by the class when the word was initially presented.

The seventeenth week of the semester was used for review in spelling. Words which seemed generally difficult

for the entire group during the semester were presented in list form and the same basic procedure was followed.

III. DAILY PLAN

Procedure for Monday

Pretest. Spelling words taken from the adopted spelling textbook for the school were read to the students on Monday as the week's pretest. The teacher read each word aloud and followed the reading with a short, simple sentence using the word. Students attempted to spell each word in full spelling using no contractions or brief-forms, and using the writing tool with which he was most comfortable. Some students used the Braillewriter, others used the slate and stylus.

Immediate correction of pretests. Each student corrected his own paper using a heavy crayon to mark those words missed. The crayon wax adhered to the Braille paper allowing the student to later feel the difference in surface texture and recognize which words he had missed. The teacher read each word aloud followed by the correct spelling of that word. To emphasize accuracy no student was asked to attempt his own spelling of any of the words during correction.

The teacher then supervised as each child wrote the correct spelling of those words which he had missed. This list was to be an addendum to the correct-copy to be used as a brief reference for the child in his study procedure. It

was the teacher's initial opinion that the addendum would be easier to use by the students than would the correct-copy listing all words for the week, however, the correct-copy proved easier.

Correct-copy. The correct-copy was the prescribed list of words for the week. Each word was spelled correctly in Braille, Grade 2 (reading Braille), on the left margin of the page followed by a series of dots leading to the same word brailled in its full spelling on the right side of the page. The correct-copy was distributed each Monday following correction of the pretest and was used by the experimental subjects in subsequent weekly study procedures.

Recording of grades. The teacher recorded the number of words missed, but no grade as such was given. Recording of the number of missed words was used as an evaluative tool by comparing the Monday and Friday results. This comparison was then used in guiding the student in the following weeks of study.

Procedure for Tuesday, Wednesday, and Thursday

Specific directions were given to the teacher for the weekly sequential study procedure for Tuesday, Wednesday, and Thursday. The student would select the word to be studied, softly read it from the correct-copy, quietly spell the word while reading it, attempt to spell the word in full by writing it, and then check his attempt with the correct-copy for accuracy. The student repeated these steps twice more so that

upon completion of the study procedure, he had three correctly spelled copies of each word. This procedure was repeated for the study of each missed word in the weekly list.

The teacher observed all students during their study procedure and was actively involved in assisting their study to assure that they were following the outlined procedure. A student observed studying by a procedure other than the outlined one was immediately redirected.

Those students missing no words on Monday's pretest were used as teaching helpers to assist weaker students. The teacher used discretion in pairing strong and weak students for the individual's best interest as well as for that of the group. The use of teaching helpers placed a reward element on correct spelling and gave importance to higher scores on the initial weekly test. The teacher used this method rather liberally as she felt it advantageous to both the strong and weak students. Teaching assistance was given quietly to avoid distracting other students.

The following table, Chart of Daily Activity, outlined what each student should accomplish daily. The number of words missed on Monday's pretest was the criterion for following the chart. As can be seen in Table I, Group I consisted of those students missing no words on the pretest, Group II missed one to four words, Group III missed four to eight, and Group IV missed more than eight words.

Group I assisted other students as teaching helpers, Group II studied all their missed words, and Groups III and IV studied only four of their missed words as outlined for Tuesday of each week.

On Wednesday, Group I continued helping weak students. Having completed their sequential study on Tuesday, Group II wrote original sentences using their words. Group III, those students missing four to eight words, completed their study of words. Students missing more than eight, Group IV, studied a second group of four words on Wednesday.

On Thursday, Group I continued assisting weaker students both in study steps and in sentence construction using each child's missed words. Group II used Thursday to write original short stories or paragraphs using their words. Students who completed their study on Wednesday, Group III, used Thursday to write original sentences using their words and Group IV studied their final group of words following the study procedure.

Procedure for Friday

All students took the final weekly test. The test scores were compared to the initial or Monday test scores to determine whether the student showed increased performance. If the Monday and Friday test scores were equal, the teacher closely observed the child during the following week determining if the child was following the steps of the study procedure correctly. Should the Monday score be higher than the

TABLE I

CHART OF DAILY ACTIVITIES PROVIDING DIRECTIONS FOR EACH STUDENT
BASED ON THE NUMBER OF WORDS MISSED ON THE MONDAY PRETEST

Group number	Tuesday	Wednesday	Thursday	Friday
Group I, No words missed	Assist weak students in need of help on spelling study	Same as for Group I on Tuesday	Write creative paragraphs/sentences using spelling words spelled correctly	Take Friday test and correct it to insure that student maintains level of proficiency
Group II, 1 - 4 missed	Study all of missed words following study procedure	Write original sentences using five of words from list, include those missed	Write original short story or paragraph using missed words plus others in list as desired	Take Friday Test, correct it, determine whether or not student has improved since last test
Group III, 4 - 8 missed	Study four (4) of missed words following study procedure	Study rest of missed words accord- ing to study procedure	Write original sentences using missed words	Same as above, retest and evaluate
Group IV, more than 8 missed	Study four (4) of missed words following study procedure	Study four (4) additional words which were missed, follow study procedure	Study rest of missed words following study procedure	Same as above, retest and evaluate

Friday score, the teacher attempted to discover the reason by evaluating the child's study approach and by correcting it, if necessary.

IV. ENRICHMENT

The devised study procedure did not utilize the entire spelling period every day. Occasionally as students completed their daily study procedure they were placed into groups of three or four and continued word study through the use of oral activities devised by the teacher and the students. The most popular activity was a game which the students called "I am thinking of a word." The leader would state that he was thinking of a word which started with a particular letter and consisted of a certain number of letters. Other students would then take turns guessing the word by spelling it aloud. The first student to correctly guess and spell the word then became leader.

If all students completed their study for a particular day they played a circle game which was based on the spelling words being studied. This game consisted of the total group forming a circle. The teacher would read a word from the current list and students took turns adding one letter to spell the word. Any student missing his letter of a particular word was excused from the circle. He could come back into the circle when another student missed a letter and left the circle. The use of devised games, such as the ones described emphasized correct spelling and reinforced the study skills.

V. CHAPTER SUMMARY

The classroom procedure for the experimental group was based on several assumptions derived from general spelling methodology stipulating the length of the period and the approach to be used as well as how the words were to be introduced.

The experimental plan for the semester demanded that all students, both experimental and comparison, receive the Stanford Achievement Test before and after the experimental procedure while only the experimental subjects received the experimental method. Briefly this method consisted of a weekly pretest, a sequential approach to study of the week's missed words, and a post-test on each week's list. The sequential study provided that each child would study only those words which he missed during the initial or pretest rather than study all words presented for the week. The weekly study schedule was dependent upon the number of words missed on the week's initial test, thus individualizing the procedure for each experimental subject.

Enrichment in the form of games and drill was added to the program as stimulation to the students and as emphasis on spelling as part of the curriculum.

CHAPTER V

RESULTS OF THE STUDY

The objective of the study was to determine the effectiveness of a test-study-test method of spelling instruction. The sample consisted of two groups of blind third graders. One group received the test-study-test method, but both groups took the Stanford Achievement Test at the beginning and end of the study.

The raw scores obtained from the Stanford Achievement Test were used as comparisons since these scores were within one grade level and within one subject area. The words in each form of the spelling subtest had been rated according to difficulty and the intervals between grade equivalent scores did not necessarily have the same values as the intervals between raw scores.¹

I. PRESENTATION OF RAW DATA

There was no significant difference between the chronological ages of the two groups nor the intelligence quotients. The data are reported in Table II and III, page 48.

¹Truman L. Kelley and others, Stanford Achievement Test, Directions for Administering Primary II Battery (New York: Harcourt, Brace and World, Incorporated, 1964), p. 25.

TABLE II
COMPARISON OF CHRONOLOGICAL AGES REPORTED IN
MONTHS FOR ALL SUBJECTS

	Experimental	Comparison
Means	117.3	121.6
Standard Deviation	11.73	7.79
<u>t</u> Value	.8632	
Probability	N.S.	

TABLE III
COMPARISON OF INTELLIGENCE QUOTIENTS OF ALL
SUBJECTS

	Experimental	Comparison
Means	100.5	97.2
Standard Deviation	13.58	14.55
<u>t</u> Value	.0583	
Probability	N.S.	

Table IV, page 50, reports the raw scores obtained by each subject on the pre- and post-Stanford Achievement Tests (SAT I and SAT II) and shows the individual differences between these scores. These differences reflect an over-all increase by the majority of subjects.

II. STATISTICAL PROCEDURE

The t Test of Statistical Analysis as described by Edwards was used in the treatment of the data.² A .05 confidence level was accepted as significant.

Initial Analysis

Appropriateness of selected test. Table V shows the score gains or differences found between SAT I and SAT II for the experimental group. The t value of 8.13 was significant beyond the .01 level. The difference between the comparison group's initial and final tests yielded a t value of 3.18 which was also significant beyond the .01 level and is reported in Table V, page 52.

²Allen L. Edwards, Statistical Analysis for Students in Psychology and Education (New York: Rinehart and Company, Incorporated, 1946), pp. 172-91.

TABLE IV
INITIAL AND FINAL STANFORD ACHIEVEMENT TEST SCORES
FOR BOTH GROUPS

Experimental				Comparison			
Sub.	SAT I	SAT II	Diff.	Sub.	SAT I	SAT II	Diff.
1	3	7	4	1	28	28	0
2	20	28	8	2	26	30*	4
3	21	29	8	3	28	30*	2
4	25	28	3	4	25	28	3
5	22	29	7	5	16	17	1
6	19	30*	11	6	30*	29	-1
7	11	21	10	7	20	27	7
8	18	27	9	8	26	30*	4
9	24	30*	6	9	20	29	9
10	16	28	12	10	23	28	5
11	9	20	11				
12	5	15	10				
13	20	30*	10				
Means	16.4 ^a	24.7 ^b	8.4 ^c		24.2 ^a	27.6 ^b	3.4 ^c

* Maximum score possible for this level of test

^a Significant difference = .05

^b No significant difference

^c Significant difference = .01

Pre-test scores for both groups. The difference between the two groups' means for SAT I yielded a probability of .05 as indicated by a t value of 2.76. This is shown in Table VI, page 52.

Post-test scores for both groups. The mean SAT II score of the experimental group was not significantly different from the mean SAT II score of the comparison group. Data are reported in Table VI, page 52.

Gains made by each group. The mean of the simple gains exhibited between SAT I and SAT II for the experimental group was 8.39. The corresponding comparison mean was 3.4. The difference in these means yielded a t value of 3.42 which was significant at the .01 level of confidence. Data on simple gains are reported in Table VII, page 53.

Projected and observed post-test scores. Projected scores for the experimental group computed by adding three word-scores to the pre-test results for each subject are reported in Table VIII, page 53. SAT II results for the experimental group are also reported. The t value of 1.94 yielded no difference between the two scores for the experimental group.

TABLE V
DIFFERENCES BETWEEN THE PRE-AND POST-TEST SCORES
FOR THE TWO GROUPS

	Experimental		Comparison	
	SAT I	SAT II	SAT I	SAT II
Means	16.4	24.8	24.2	27.6
Standard Deviations	6.78	6.69	4.29	3.67
<u>t</u> Value	8.13		3.18	
Probability	<.01		<.01	

TABLE VI
DIFFERENCES BETWEEN THE GROUPS ON THE PRE-TEST AND
ON THE POST-TEST

	S A T I		S A T I I	
	Exp.	Comp.	Exp.	Comp.
Means	16.4	24.2	24.7	27.6
Standard Deviations	6.78	4.29	6.69	3.67
<u>t</u> Value	2.76		1.14	
Probability	<.05		N.S.	

TABLE VII
COMPARISON OF THE SIMPLE GAINS MADE BY THE
TWO GROUPS

	Experimental	Comparison
Means	8.4	3.4
Standard Deviations	2.63	2.94
<u>t</u> Value		3.42
Probability		<.01

TABLE VIII
COMPARISON OF THE PROJECTED FINAL SCORE TO THE
OBSERVED FINAL SCORE FOR THE EXPERIMENTAL GROUP

	Projected	Observed
Means	19.4	24.8
Standard Deviations	6.86	6.80
<u>t</u> Value		1.94
Probability		N.S.

Secondary Analysis

Because there was a difference noted between the means of the two groups on the pre-test, additional treatment of the data was in order.

Analysis of covariance. Table IX, page 55, shows the results of the analysis of covariance. When the variable of statistical difference in the SAT I results for the two groups was considered, treatment of the data yielded no differences between the two groups on SAT II. The analysis did yield a difference (.05) between SAT I and SAT II for each group and a difference between the SAT I results for the two groups. These data repeat the initial findings and are reported in Table IX.

III. CHAPTER SUMMARY

Initial analysis yielded the following findings.

1. There was a significant difference (.01) between SAT I and SAT II for both groups.
2. There was a significant difference (.05) between the two groups on SAT I.
3. There was no significant difference between the groups on SAT II as shown by simple analysis.
4. There was a significant difference (.01) between the groups on simple gains made, i.e., SAT II less SAT I.
5. There was no significant difference between the experimental projected SAT II results and actual SAT II results.

TABLE IX
THE ANALYSIS OF COVARIANCE BETWEEN THE GROUPS^a

Model	Predictors	R^2	df	F	P
H_{0F}	X_1, X_2, Y_1, Y_2	.3541	4	-	-
H_{0I}	$X_1 - Y_1 = X_2 - Y_2$	.3231	3	2.01	-
H_{0II}	$X_1 = X_2 = A_0$ and $Y_1 = Y_2 = B_0$	.1359	2	7.08	.05
H_{0III}	$X_1 = Y_1 = A_0$ and $X_2 = Y_2 = B_0$	.1885	2	5.38	.05

^aKey to symbols in Table IX:

X_1 = experimental SAT I; X_2 = experimental SAT II

Y_1 = comparison SAT I; Y_2 = comparison SAT II

A_0, B_0 = constant number

The analysis of covariance yielded the following findings on the same data.

1. There was no significant difference between the groups on the SAT II when the variable of SAT I differences was considered.

2. There was a significant difference (.05) between SAT I and SAT II results for each group.

3. There was a significant difference (.05) between the groups with regard to the SAT I results.

CHAPTER VI

SUMMARY, DISCUSSION, CONCLUSIONS,
AND RECOMMENDATIONS

I. SUMMARY

A test-study-test method of spelling instruction utilizing a sequential study procedure was formulated and adjusted to the needs of Braille-using blind third-grade students. This method was suggested by research findings and each factor of the method was supported in research for the sighted child.

It was hypothesized that through the use of the experimental method of instruction, spelling proficiency could be increased significantly; that subjects using the experimental method of study would show greater gains in a pretest and post-test situation than would equated comparison subjects not receiving the method.

A blind child is taught to type early in his educational career because it is believed that effective written communication from blind to sighted is dependent upon proficiency in typing skills. Correct spelling must be emphasized prior to typing instruction as the Braille code restricts correct spelling by its use of abbreviations and brief-forms.

Basic limitations identified in the study are as follows: (1) the total study population was drawn from residential schools for the blind in two different states; (2) the study was restricted to third-grade pupils; (3) the total study population consisted of only twenty-three subjects; and (4) the experimental subjects were in one group with one teacher while the comparison group was divided between two teachers.

The two groups were equated on the basis of chronological age and intelligence quotients. All subjects used Braille and were enrolled in the third grade of their respective schools.

The experimental group took the spelling subtest of the Stanford Achievement Test at the beginning of the experimental period. The students were then instructed using the devised method and at the end of the experimental period they took a second form of the spelling subtest. The comparison group received the pre- and post-spelling subtests but not the experimental method.

Briefly, the experimental method of instruction consisted of a weekly pretest, a sequential study of the week's missed words, and a post-test on each week's list. The sequential study provided that each child would study only those words which he missed during the weekly pretest. The weekly study schedule was dependent upon the number missed, thus the procedure was individualized for each experimental subject.

The experimental method was repeated weekly for a total of seventeen weeks (one semester) and each student's progress or regression was charted to supply exact figures for determining the extent of weekly change.

The major adjustment in the method as provided in general spelling methodology was in making it applicable to blind students through the medium of Braille. Therefore only Braille materials were used. The correct-copy was of primary importance in that it overcame the difference between the Braille code as it is read by the child and the code in its full spelling of the words for spelling and typing purposes.

The primary finding of the study was that there was no significant difference between the post-test scores for the two groups as both groups made gains during the semester. However, the experimental gains were equal to what could be expected for sighted children of equal age.

II. DISCUSSION

In considering the basic limitations of the study, the statistical findings of no difference between the experimental and comparison groups on the pre- and post-test situation possibly could have been predicted. The limited number of subjects involved in the study, the brief duration of the method, the use of groups from two states, the

administrative sectioning of class loads, and the low ceiling of the test instrument all interrelated to nullify any changes which could have been in evidence. The majority of the limitations are directly related to the small numbers of blind children represented in the population at large and to the limited number fitting the established criteria for the study. Only the limitation of low test ceiling could have possibly been eliminated. However, according to the comparisons of raw score increases from one form of the Stanford Achievement Test to the next higher form of the test, the interlevel comparisons become distorted also.

Analysis of the statistics revealed that both groups made significant gains during the study establishing the appropriateness of the Stanford Achievement Test as an instrument for measuring any gains in spelling for these groups.

Comparisons of the pretest means for the two groups established a significant difference between the groups with the comparison group scoring higher initially. The post-test between-group comparison yielded no difference. This could be interpreted to mean that the experimental group made greater gains than did the comparison group and thus "caught up." Simple analysis appeared to support this interpretation by yielding a significant difference between the groups on gains made. However, a fallacy in this interpretation weakens its reliability. The ceiling of the test

instrument was reached by one comparison subject on the pretest and by three comparison and three experimental subjects on the post-test. Cross evaluation of actual score increases of the six "ceiling breakers" on the post-test revealed a mean increase of 9 for the experimental three subjects and 3.3 for comparison. It can be supposed that the three experimental subjects could have gone no further than the test ceiling because their mean gain of nine was greater than the mean gain for the total experimental group ($\bar{X} = 8.4$). The increase of 3.3 given above was less than the mean increase ($\bar{Y} = 3.4$) for the total comparison group. This suggests that the comparison subjects could have gained more but were penalized by the low ceiling.

When each subject provided his own initial base, i.e., simple increases in scores for each subject, it was found that the experimental group actually made greater gains than did the comparison group. Whether these gains can be attributable to the experimental method or whether the combination of low initial experimental scores and low ceiling of the test caused the observed difference must be left to analyses of possible replications of this study.

The regression equation of the analysis of covariance yielded no significant differences between the post-test scores of the two groups even though there was a significant difference established on the pretest. This finding tends to nullify the premise that the experimental group "caught up" with the

comparison group during the course of the experimental method. In effect, the experimental method of instruction proved no better than the comparison method of instruction during this experimental period.

It has been suggested previously in this study, and has been supported by research, that blind students tend to progress academically at a slower rate than their sighted peers. This statement was not supported by this study. The initial scores of the experimental group were projected by one-half year (an additional three words) to determine what score each subject might be expected to make on the final test. This projection was based on the published mean growth expected by the population on which the Stanford Achievement Test was standardized and represents the sighted peer population.

Comparison of the projected scores and the actual scores for the experimental group yielded no difference. In effect this group of blind children did make gains in keeping with the expected gains of the sighted peer population. It is suggested that when blind children provide their own base score which is then projected according to the normal expected growth, the blind children will attain their projected score.

This supposition of attaining projected expectancies appears to have implications for the education of blind children. If the experimental subjects can make strides

comparable to the normal mean expectancy, then why are blind children, as a group, one to three years retarded in academics? One factor could be that although they are making normal gains, the blind as a group begin these gains later than their sighted peers. This seems to indicate the necessity of early education for the blind and perhaps there is also need for an extension of the school year to compensate for the slowness inherent in the use of present tools of education as well as within the present methods.. It is possible that totally new methods are needed for educating this segment of the population rather than attempting the adjustment of old methods found successful with sighted students.

These ideas illuminate two very broad but basic questions which must be answered if the education of blind children is to advance. Answers were not within the realm of this report, but perhaps future investigations brought to bear on these ideas will be fruitful. The following questions are pertinent. Are methods of instruction which have proved beneficial to the sighted child, with minor adjustments in the medium or tools of learning, really adequate to the needs of blind children, or must unique methodologies be established and practiced for these children? Why must totally blind children learn to "read" in the traditional sense of the word? If the general goal of reading is to serve as a key to broader knowledge, then

reading of Braille -- as opposed to audible reproduction of the same material -- actually inhibits the broadening of knowledge due to the limited availability of brailled materials and to the slowness with which Braille is read by touch.

III. CONCLUSIONS AND RECOMMENDATIONS

It must be concluded that the experimental method of instruction, although supported by research for sighted children, did not cause the experimental subjects to make significantly greater gains than did the equated comparison subjects. It seems indicated that further investigation is needed in which a larger sample of subjects can be obtained and in which the duration of the experimental method can be extended to encompass at least one full academic year.

A major outgrowth of this study was the questioning of the use of an experimental and a comparison group for method evaluation since the total study population was small. Findings might have been more revealing if both groups had received the experimental method and growth had been determined by comparing each child with his own initial performance. Detailed analysis of the operating variables in the teaching-learning process would undoubtedly shed additional light on the relative effectiveness of methodologies employed in spelling instruction for blind students.

Perhaps the basic premise of this study could furnish the foundation for a new investigation which would expand the total study. Within this expansion, it is recommended that a battery of tests be used both initially and finally that will provide an adequate ceiling in the test instrument and will assure that the students are being properly measured.

The new study design could include two groups, A and B, and be designed so that during the first semester Group A would receive the experimental method while Group B received a comparison method. For the second semester, then, the groups could be reversed with Group B becoming the experimental group. In this way the method could be isolated from several variables inherent in the design of the present study, and only the method would be evaluated. A long-term follow-up could also be included which would involve an evaluation of the introduction of typing as a tool skill to determine if emphasis on spelling as a pretyping transitional subject actually enhances accuracy at the typewriter.

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APPENDICES

TABLE X

INDIVIDUAL CHRONOLOGICAL AGES OF EXPERIMENTAL
AND COMPARISON SUBJECTS

EXPERIMENTAL GROUP		COMPARISON GROUP	
Subject	Age in Months	Subject	Age in Months
X ₁₁	139	Y ₉	132
X ₆	134	Y ₁	131
X ₇	132	Y ₆	125
X ₁	126	Y ₁₀	125
X ₁₃	123	Y ₄	123
X ₂	116	Y ₃	121
X ₉	112	Y ₅	121
X ₃	109	Y ₇	119
X ₄	108	Y ₂	116
X ₁₂	108	Y ₈	103
X ₅	107		
X ₈	107		
X ₁₀	104		
Mean	117.3	Mean	121.6
Range of ages in months	104 to 139	Range of ages in months	103 to 132
in years	8-8 to 11-7	in years	8-7 to 11-0

TABLE XI

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REPORTED INDIVIDUAL INTELLIGENCE QUOTIENTS OF
EXPERIMENTAL AND COMPARISON SUBJECTS

EXPERIMENTAL GROUP		COMPARISON GROUP	
Subject	I Q	Subject	I Q
X ₈	124	Y ₁₀	122
X ₃	117	Y ₈	120
X ₄	117	Y ₂	110
X ₆	109	Y ₁	97
X ₁₀	105	Y ₃	97
X ₉	103	Y ₉	91
X ₁₂	98	Y ₅	88
X ₁₃	97	Y ₄	87
X ₅	96	Y ₆	80
X ₁	93	Y ₇	80
X ₂	90		
X ₇	82		
X ₁₁	75		
Mean	100.46	Mean	97.20
Range	75 - 124	Range	80 - 122

APPENDIX B

QUESTIONNAIRE ON THE COMPARISON METHOD OF
SPELLING INSTRUCTION

The following questions were asked the teacher of the comparison group; her answers were recorded by the investigator of the study.

1. Was spelling taught five days a week?

Generally, unless something more important came up.

2. How long was each spelling period?

Usually for 30 minutes.

3. Were the spelling periods at the same time each day?

No, tests were usually given the first thing in the morning, but study was the last period each time.

4. Were the students given a pretest on Monday?

No, it was given on Tuesday after the students had a chance to study the words.

5. Were the words presented in list form?

No, by the story given in the text.

6. Did you assist pupils in syllabifying words; place emphasis on this?

Yes, it was important to their learning.

7. Were the words analyzed phonetically?

Yes, quite a lot of emphasis was placed on long and short vowel sounds, and in grouping like words to draw a generalization from them.

8. Did students correct their own papers following a test?

No, not generally, the teacher generally did this.

9. During the checking of tests, were the students called on to attempt to spell the word orally?

No, the few times the students checked their own papers, the teacher spelled all words.

10. Was emphasis placed on "drill" over words?

There was a minimal amount of memorizing, this depended on the student; as a group - no.

11. Did students use spelling words in creative writing (all of the list, or only ones missed)?

No, this was not encouraged.

12. Did the students study the entire week's words or only the ones missed on the first test?

On Monday, they studied all words with emphasis placed on difficult parts of words; after the test, they studied their missed words plus reviewing all words for the week before the Friday test.

13. How many times was each word correctly written during the study procedure?

No set number of times; this depended on the word and sometimes on the child - the average was from three to six times each.

14. What was the weekly schedule for spelling?

On Monday, words were presented and all were studied; Tuesday, initial test over all words was given and the teacher corrected the test; Wednesday, students studied their missed words - those missing no words were excused for pleasure reading; Thursday, continued as Wednesday; Friday, students missing words on Tuesday took a final weekly test, the teacher corrected and graded the papers.

15. What was the study procedure on individual words?

(1) The student looked at the word in the spelling text; (2) pronounced the word to the teacher for her to be assured that he could, and that he had some knowledge of its meaning or use; (3) spelled the word silently without looking at it; (4) checked his oral spelling by looking at word in book; (5) attempted to write the word; (6) teacher checked attempt; and (7) if attempt was correct, the student wrote the word several times.

16. Were the high achievers on the initial test excused from formal spelling instruction?

Yes, students who made 100 on Tuesday could use the spelling time for other work or pleasure reading.

17. Were the high achievers on the initial weekly test encouraged to assist weaker students?

No, the teacher was better equipped to assist.

18. Did the initial high achievers have to take the Friday test?

No, not if they made 100 on the first one.

APPENDIX C

CORRECT COPY

Directions for brailing.

The following list of spelling words, called Correct Copy, is to be brailled in the following manner:

1. Center the words "CORRECT COPY" at the top of each page; leave approximately one inch for a top margin.
2. Center the words "LESSON ..." immediately under Correct Copy.
3. Set a left-hand margin on the braillewriter approximately one inch from the left side of the page.
4. Braille each word in the left-hand column in Braille Grade 2.
5. Skip two spaces after each word in the left-hand column.
6. Using Dot 6, space over ten times.
7. Skip two spaces after the line of dots just formed.
8. Braille the right-hand column of words in their full spelling. Do not use brief forms or contractions but braille each letter of the word.
9. The CORRECT COPY for each lesson is to be done on a separate and individual page even though it may not fill the page.

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